SCREENING SITE INSPECTION
SITE EVALUATION
GRANVILLE SOLVENTS, INC.
PALMER LANE P.O. BOX 95
GRANVILLE, OHIO 43023

U.S. EPA ID NO.: OHD 004 495 412

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
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1.0 INTRODUCTION

Under contract 68-W8-0084, work assignment 29-5JZZ, PRC Environmental Management, Inc. (PRC), has evaluated the Granville Solvents, Inc. (GSI), site in Granville, Licking County, Ohio, using the Hazard Ranking System (HRS). This report presents the results of PRC's evaluation and summarizes the site conditions and targets pertinent to the contaminant migration and exposure pathways associated with the GSI site. Information was obtained from U.S. Environmental Protection Agency (EPA) and Ohio Environmental Protection Agency (OEPA) files.

This report has five sections, including this introduction. Section 2.0 describes the site. Section 3.0 discusses the site operations and history. Section 4.0 discusses previous investigations at the site. Section 5.0 provides information about the four migration and exposure pathways (groundwater, surface water, soil, and air). References used in this evaluation follow the text. Site photos are included as Appendix A.

2.0 SITE DESCRIPTION

The GSI site is the location of an inactive solvent blending and recycling operation on Palmer Lane in the rural community of Granville, Licking County, Ohio, as shown in Figure 1. Approximately ⅓ mile southwest of downtown Granville, GSI is in a primarily residential area that has some commercial and light-industrial businesses nearby. The site is bordered to the north and west by Palmer Lane, to the west and south by a bicycle and walking path, and to the east by the former village of Granville water treatment plant and the Cherry Street overpass. The nearest business is a lumber yard on the east side of the former water treatment plant. The nearest residence is at 327 Maple Street, about 100 feet north of the GSI site. Raccoon Creek is approximately 100 feet south of the GSI property. This creek flows west to east. The village of Granville's municipal wellfield is approximately 1,000 feet west of the GSI site.

On May 25, 1993, PRC visited the GSI site for an inspection. The triangular GSI property occupies approximately 1.5 acres. The northern portion of the property slopes south toward Raccoon Creek. The southern and lower portion of the site is relatively flat (see photograph No. 6). The property

is covered with many mature trees and dense brush (see photographs No. 1 and 5).

Vehicular access to the site is via Palmer Lane, which is approximately 350 feet southwest of the intersection of West Maple Street and Cherry Street (see photograph No. 7). The property is accessible to pedestrians from State Route 37 along the abandoned Penn Central Railroad line, which has been converted into a bike path (see photograph No. 8). This property is owned by the Evans Foundation of Newark, Ohio. The site's features are shown in Figure 2.

There are three buildings on site. The largest is 40 feet by 48 feet and is constructed of galvanized metal siding supported by a wood and metal frame anchored on 10 concrete piers (see photographs No. 2 and 4). The floor consists of 4-inch-thick reinforced, concrete slabs. Access to the building is gained through two large sliding doors on the east and west walls, and two smaller loading doors on the south wall (see photographs No. 2 and 3). This building is referred to as the warehouse and was used for GSI's manufacturing operations and for storage. The warehouse's floor has a small, unlined pit that is about 3 feet deep near the building's northeast corner (see photograph No. 3), which is thought to be a source of groundwater contamination (OEPA 1991c), has also been referred to as a sump. There is a second unlined depressed area in the warehouse floor in the northwest corner. Pipes leading to the former tank farm entered the building in this corner (PRC 1993a).

Two smaller buildings are near the warehouse. One, a 12-foot by 12-foot wood-frame building located 10 feet west of the warehouse, contained an employee lounge, a washroom, and a small lab. The second building, which is approximately 25 feet northeast of the warehouse, is a 10-foot by 12-foot wood-frame building that housed an air compressor.

A gravel road leading from the facility's entrance road provided access to the metal sliding doors on the western side of the warehouse. A tank farm was located outside the northwest corner of the warehouse, directly north of the warehouse access road. This tank farm contained both aboveground and underground storage tanks, which were removed during a removal action in 1990 and 1991, started by Clean Harbors of Kingston, Inc. (Clean Harbors) and completed by Compliance Solutions,

Inc. (Compliance Solutions), two OEPA contractors. There is a gravel parking lot adjacent to the southern side of the warehouse.

3.0 SITE OPERATIONS AND HISTORY

GSI began operations in 1953 as a petroleum solvent storage, packaging, blending, and distribution facility. The company moved its operations to the Palmer Lane site in 1958, where it continued the same activities until 1980. Operations at the site prior to 1958 are unknown. In 1980, GSI ceased its petroleum-related activities and began operating as a solvent reclamation and recycling facility for small-quantity generators of industrial solvent waste (OEPA 1985b). The facility was active until 1986. The solvents were stored in approximately fifteen 500-gallon to 5,000-gallon aboveground and underground storage tanks as well as in several hundred 55-gallon drums (Weston-Sper 1988).

GSI submitted a Resource Conservation and Recovery Act (RCRA) Part A permit application in 1980 and operated under interim status until 1988, when EPA revoked GSI's interim status. In 1982, OEPA conducted a RCRA compliance inspection and noted several violations. At the time of the inspection, GSI was storing more waste than allowed for facilities with interim status, and was using inadequate waste container storage practices. Furthermore, several containers were leaking and open. OEPA also found that GSI's contingency plan was inadequate and that spill prevention measures had not been taken by the facility (OEPA 1982).

In 1983, GSI submitted a RCRA Part B permit application to EPA, indicating that the facility was seeking a permit to be regulated as a treatment, storage, or disposal facility. EPA found the application inadequate, and, in 1984, GSI submitted a revised application, which EPA also found to be deficient (GSI 1984). Also in 1984, GSI submitted a closure plan and notified EPA that operations were going to be moved to another location. Later in 1984, GSI submitted a revised closure plan for only part of the site and stated that the facility would continue operations as a transfer and storage facility at the Palmer Lane location. GSI also submitted a revised Part B permit application in early 1985. EPA again found this permit application to be inadequate (EPA 1988).

In August 1986, the Licking County Court of Common Pleas ordered GSI to cease operations because of noncompliance with OEPA's financial responsibility regulations. GSI ceased operations but

because of contract restraints, Clean Harbors was unable to finish the project; OEPA then contracted Compliance Solutions to complete the task (Compliance Solutions 1992a).

By May 20, 1991, all work started by Clean Harbors, as well as decontamination of the warehouse, employee lounge, and steel shed housing the air compressor, disposal of all wastewater, backfilling of tank excavation pits, and site restoration, had been completed. Compliance Solutions also installed 11 additional monitoring wells around the warehouse and downgradient of the site (see Figure 2) to determine the extent of migration of contaminants that had been detected in samples collected from the monitoring wells initially installed by Clean Harbors (Compliance Solutions 1992b). These additional wells were installed to further characterize hydrogeology at the site and to monitor the migration of groundwater contamination. The groundwater and well-casing elevations of all 15 monitoring wells are summarized in Table 1.

Contaminants have been detected in groundwater samples collected from the monitoring wells installed by Clean Harbors and Compliance Solutions. OEPA has monitored the migration of a contaminant plume using analytical data obtained from 7 sampling events that have occurred in the last 3 years. Several volatile organic compounds (VOC) have been detected in the contaminant plume. The compounds that have been detected most frequently and at the highest concentrations are tetrachloroethene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), and cis-1,2-dichloroethene (cis-1,2-DCE) (Compliance Solutions 1992b, 1993). These compounds are known to have been handled during site operations (GSI 1984).

Laboratory results from VOC analyses of the groundwater samples collected during the seven sampling events are summarized in Tables 2 through 7. Each table lists all the VOCs detected in the monitoring wells over the past 3 years; additional VOCs were analyzed for, but because they were not detected in any of the samples, they are not listed in the tables. Carbon disulfide was tentatively identified in a sample collected from MW-3 in January 1991, and dimethyl sulfide was tentatively identified in a sample collected from MW-1 in January 1991. Twelve of the compounds listed in the tables were detected only in the October 1991 samples. These compounds were benzene; bromoform; carbon tetrachloride; chloroethane; chloroethene; methylene chloride; trichlorofluoromethane; 1,2-dichlorobenzene; 1,4-dichlorobenzene; 1,1,2-trichloroethane; 1,2,3-trichlorobenze; and

Table 2

Summary of Monitoring Well Sample Analyses for Samples Collected on 1/30/91

	Sampling Location				
VOLATILE ORGANIC COMPOUNDS (ug/L)	MW-1	MW-1A	MW-2	MW-3	MW-4
Acetone	NA	NA	NA	NA	NA
Benzene	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND
Chloroethene	NA	NA	NA	NA	NA
Chloroform	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	412	5.9	90
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA
Dibromochloromethane	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND
Tetrachloroethene	*95*	*95*	*85*	*0.8*	*360*
Toluene	ND	ND	ND	ND	ND
Total xylenes	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	13	ND	ND
Trichloroethene	359	369	54	19.9	3040
Trichloroflouromethane	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	1.2	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND
1,1-Dichloroethane	32	35	40	4.7	10
1,1-Dichloroethene	106	109	52	ND	75
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	630	1160	600	1.8	850
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND

Notes: ug/L = Micrograms per liter
ND = Not detected
NA = Not analyzed
MW-1A is a duplicate sample of MW-1.

Table 4

Summary of Monitoring Wells Sample Analyses for Samples Collected on 10/8/91

	Sampling Location									
VOLATILE ORGANIC COMPOUNDS (ug/L)	MW-1	MW-3	MW-4	MW-4A	MW-4D	MW-5	MW-6	MW-6A	MW-7	MW-7D
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	ND	ND	ND	1.2	0.7	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	11.8	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	0.8	ND	ND
Carbon tetrachloride	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	1.1	1.8	ND	ND	ND	ND	ND
Chloroethene	ND	ND	ND	ND	1.0	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	3.5	1.5	ND	ND	38.6	ND	ND
cis-1,2-Dichloroethene	0.7	3.9	38.2	76	1070	ND	8.5	ND	1.3	ND
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	3.6	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	2.0	ND	ND
Tetrachloroethene	38.2	1.1	>188	268	840	ND	9.8	ND	1.6	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	1.5	1.7	20	ND	ND	ND	ND	ND
Trichloroethene	>102	27.6	>248	3140	1180	ND	>148	ND	3.9	ND
Trichloroflouromethane	ND	ND	ND	6.1	2.9	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	5.4	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND
1,1-Dichloroethane	>74	6.5	ND	61	88	ND	ND	ND	ND	ND
1,1-Dichloroethene	>71	1.1	>88	16.7	9.6	ND	>90	ND	ND	ND
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	ND	3.3	ND	1650	910	ND	ND	ND	1.0	ND
1,1,2-Trichloroethane	ND	ND	ND	0.5	0.5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	1	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND

Notes: ug/L = Micrograms per liter
ND = Not detected
NA = Not analyzed

MW-2 was not sampled during this sampling event.
MW-4A is a duplicate sample of MW-4.

Table 6

Summary of Monitoring Well Sample Analyses for Samples Collected from 6/18/92 to 6/19/92

	Sampling Location													
VOLATILE ORGANIC COMPOUNDS (ug/L)	MW-1	MW-2D	MW-3	MW-4	MW-4D	MW-4D2	MW-5	MW-6	MW-6D	MW-7	MW-7D	MW-8	MW-8D	P-1
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	820	ND	30	80	110	ND	20	ND	ND	ND	ND	ND	410
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	ND	ND
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	60	680	ND	260	300	177	ND	40	ND	ND	ND	ND	ND	1300
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.0
Trichloroethene	160	1600	ND	2800	470	136	ND	1000	6	ND	ND	ND	ND	3300
Trichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	10	54	ND	160	200	ND	ND	ND	ND	ND	ND	ND	ND	20
1,1-Dichloroethene	15	28	ND	60	17	ND	ND	40	ND	ND	ND	ND	ND	70
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	850	1300	ND	1600	560	140	ND	1900	23	ND	ND	ND	ND	1250
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3 Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: ug/L = *Micrograms per liter*
ND = Not detected
NA = Not analyzed
MW-2 was not sampled during this sampling event

1,2,4-trichlorobenzene. The presence of these compounds in the October samples may be questionable because, according to OEPA, gas chromatographic peaks exceeded instrument calibration ranges, and as a result, the data were rejected (OEPA 1993a).

Groundwater samples collected on January 30, 1991, were also analyzed for semivolatile organic compounds (SVOC), pesticides, and polychorinated biphenyls (PCB). No positively identified SVOCs were detected in any of these samples, but four tentatively identified SVOCs were detected in MW-2, and five tentatively identified SVOCs were detected in MW-3. In addition, low concentrations of the following pesticides were detected in MW-2, MW-3, and MW-4: heptachlor, dieldrin, gamma-BHC, and delta-BHC. No PCBs were detected in any of the samples. The groundwater samples collected on March 26, 1991, were also analyzed for SVOCs; three tentatively identified SVOC compounds were detected in MW-3.

In addition to groundwater samples, surface and subsurface soil samples were collected during OEPA's investigation. Soil samples were collected using with a split-spoon sampler during installation of monitoring wells MW-2D, MW-4D2, MW-6D, MW-8, MW-8D, and MW-P1. Monitoring well MW-4D2 is the deepest well and was installed to determine the vertical extent of contamination. MW-P1 was originally installed as a piezometer. Because of the high concentration of VOCs in soil and groundwater in its vicinity, it has since been used for groundwater analysis (PRC 1993g). The soil samples were analyzed for VOCs and, generally, the samples that were collected from between 20 and 40 feet below ground surface (bgs) contained the highest concentrations of VOCs. Subsurface samples collected at MW-2D and MW-4D2 contained the highest concentrations of contaminants of the five locations (Compliance Solutions 1993). With the exception of P-1, surface soil samples contained relatively low concentrations of VOCs. Total VOC concentration at P-1 was detected at 2,666.8 micrograms per kilogram (µg/kg) 3 feet bgs (BHM Environmental Laboratory 1991b). Laboratory results from VOC analysis of surface soil samples are summarized in Table 8.

Soil samples were also collected from the pit inside the northeast corner of the warehouse and from the area adjacent to the northwest corner of the warehouse. These samples contained the highest concentrations of VOCs of all soil samples collected at the site. Total VOC concentrations in the pit samples ranged from 37,414 µg/kg in the sample collected from 2 feet beneath the pit, to 3,398 µg/kg

in the sample collected from 5 feet below the pit. PCE was the VOC detected at the highest concentration in both pit samples. The total SVOC concentration in the sample collected from 2 feet beneath the pit was 27,250 μg/kg. Beta-BHC, a pesticide, was detected at 710.96 μg/kg in the same sample (BHM Environmental Laboratory 1991a). Several heavy metals were also detected in this sample. The metal detected at the highest concentration was lead at 119.2 milligrams per liter (mg/L) (Dexter Analytical Services 1991a).

The total VOC concentration in the sample collected from 0 to 1.5 feet bgs in the northwest corner of the warehouse was 1,213.03 milligrams per kilogram (mg/kg). The VOC detected at the highest concentration was 1,1,1-trichloroethane, at 242.9 mg/kg. One SVOC, naphthalene, was detected at this location at a concentration of 6,060 μg/kg. Beta-BHC was detected at 436.7 μg/kg (BHM Environmental Laboratory 1991c). The metal detected at the highest concentration at this location was barium at 60 mg/L (Dexter Analytical Services 1991b).

Samples collected near the northwest corner of the warehouse were analyzed only for VOCs. PCE was detected in three samples collected at depths of 3, 20, and 26 feet bgs at concentrations of 177; 227; and 2,254 μg/kg, respectively (OEPA 1992a).

Six composite surface soil samples were also collected at the site during OEPA's investigation. These samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals, and were compared to background concentrations detected in an off-site composite sample. The most significant organic compound detected in these samples is methylene chloride, which was detected in all the on-site samples at concentrations ranging from 230 to 880 μg/kg. Lead and chromium were detected at elevated concentrations in two of the composite samples (Clean Harbors Analytical Services 1990).

5.0 MIGRATION AND EXPOSURE PATHWAYS

This section describes the migration and exposure pathways associated with the GSI site. Section 5.1 discusses the groundwater migration pathway; Section 5.2 discusses the surface water migration pathway; Section 5.3 discusses the soil exposure pathway; and Section 5.4 discusses the air migration pathway.

The on-site monitoring wells are screened in the glacial outwash aquifer (see Figure 2). Monitoring wells MW-4, MW-P1, MW-2D, MW-6, and MW-8 are shallow wells and are screened up to 10 feet below the water table. Monitoring wells MW-4D2, MW-6D, MW-7D, and MW-8D are deeper wells screened between 18 and 35 feet below the top of the water table. Groundwater samples from the shallow wells, with the exception of MW-8, contain significantly higher VOC concentrations than do samples from the deeper wells. Since groundwater samples from the deeper wells contained low or nondetectable levels of VOCs, it appears that the contamination is concentrated in the shallow portion of the aquifer (Compliance Solutions 1993).

Wells MW-4 and MW-P1 are nearest the warehouse and indicate the highest level of total VOC contamination (4,900 to 6,400 micrograms per liter [μg/L]). The deepest well in that area, MW-4D2, shows a total VOC concentration of 550 μg/L, and MW-4D, screened at an intermediate depth, indicates an intermediate level of VOC contamination (1,550 μg/L).

The first set of shallow wells north and west (downgradient) of the warehouse are MW-2D and MW-6. These wells contain total VOC contamination ranging from 3,000 and 4,500 μg/L. MW-6D, the deep well accompanying MW-6, shows total VOC concentrations of approximately 30 μg/L.

Analysis of groundwater samples from the wells MW-7 and MW-7D, northwest of the site, revealed low concentrations of cis-1,2-DCE; PCE; TCE; 1,1,1- TCA; toluene; xylene; and 1,1-DCA. Both cis and trans isomers of 1,2-DCE have been detected in MW-8 after the last two sampling events. No contamination was detectable in MW-8D.

5.1.3 Targets

Groundwater in the vicinity of the village of Granville is used for private and municipal drinking water, irrigation, and industrial purposes. The primary source of drinking water nearest the GSI site is the village of Granville municipal wellfield, approximately 1,000 feet northwest of the site. MW-8 is about 400 feet east of the nearest municipal well. The municipal wells are developed in the same buried bedrock valley aquifer in which the GSI site is located. Based on available information, there does not appear to be any substantial confining layers in the aquifer between MW-8 and the municipal wellfield. The wellfield consists of three wells, each capable of pumping over 700 gallons per minute

to be migrating from the site to the northwest toward the cone of depression created by the village of Granville's municipal wellfield (Compliance Solutions 1993). However, based on typical hydrodynamics, hazardous substances could also migrate to Raccoon Creek by way of a groundwater-to-surface water interface. Based on groundwater elevations of the monitoring wells, it appears that this water level is equivalent to that of Raccoon Creek. Without the cone of depression created by the village of Granville wellfield, groundwater flow would be expected to follow the buried glacial valley toward Raccoon Creek. Groundwater is likely to migrate through the sand and gravel associated with the outwash and into the stream bed, assuming that Raccoon Creek is a gaining stream, which is typical for buried bedrock valleys in central Ohio. In this way, contaminated groundwater found in the shallow aquifer below the GSI site could adversely impact Raccoon Creek.

No releases to surface water from the GSI site have been documented either visually or through sample analysis. No surface water samples have been collected in Raccoon Creek. Because of the difficulty associated with determining the probable locations where groundwater may be entering the stream bed and the expected dilution of contaminants after they enter the creek, contaminants entering the creek would probably not be detected in surface water or sediment samples if they were collected.

After passing through the city of Newark, Ohio, Raccoon Creek empties into the Licking River approximately 10 miles east of the site (USGS 1982). The Licking River empties into Dillon Lake approximately 15 miles east of the GSI site.

There are no known drinking water intakes within 15 miles downstream of the GSI site. According to the Granville Village Manager, recreational fishing occurs within 0.5 mile downstream of the site (PRC 1993e). According to the Licking County game warden, significant fishing occurs in Raccoon Creek approximately 1.5 miles downstream of the site (PRC 1993f). The Licking County game warden also stated that "quite good" fishing is available after the creek flows under the Cherry Valley Drive bridge which is believed to be on the western outskirts of Newark, Ohio.

Preliminary information obtained from the Ohio Department of Natural Resources indicates that there are no ecologically sensitive environments, such as habitats for endangered species or nature preserves, within 5 to 8 miles east of the site. According to the U.S. Fish and Wildlife Service, the Indiana bat is the only federally listed endangered species in Licking County (PRC 1993h). However,

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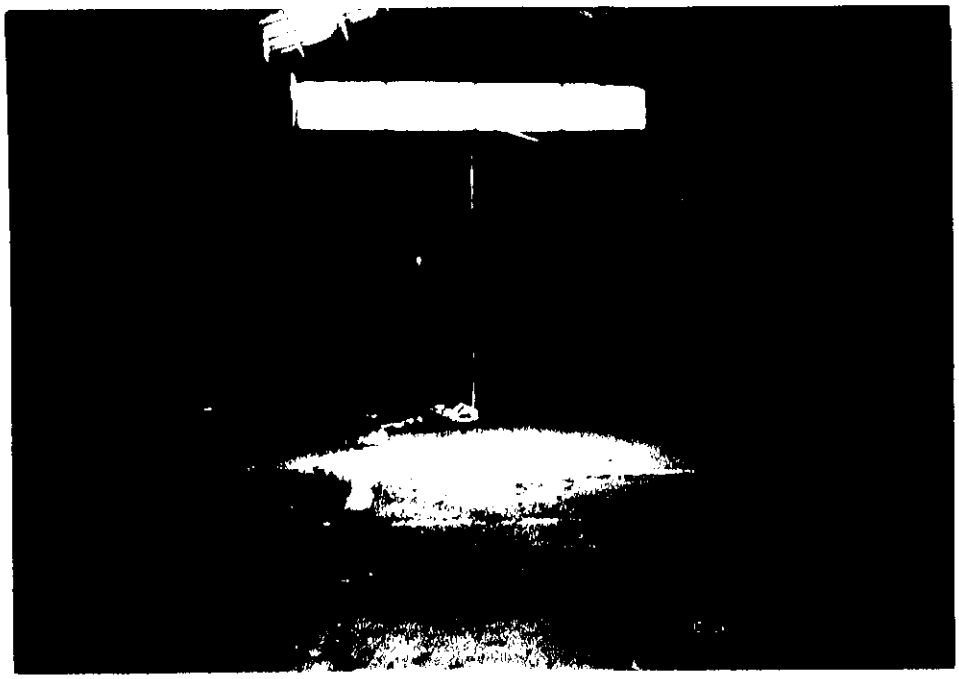
APPENDIX A

PHOTOGRAPH LOG

(Four sheets)

Photograph No. 1
Orientation: Southwest Date: 5/23/93
Description: Old steel building and storage building located at the facility

Photograph No. 2
Orientation: East Date: 5/23/93
Description: West entrance and inside of warehouse; drums shown on north side of building are empty

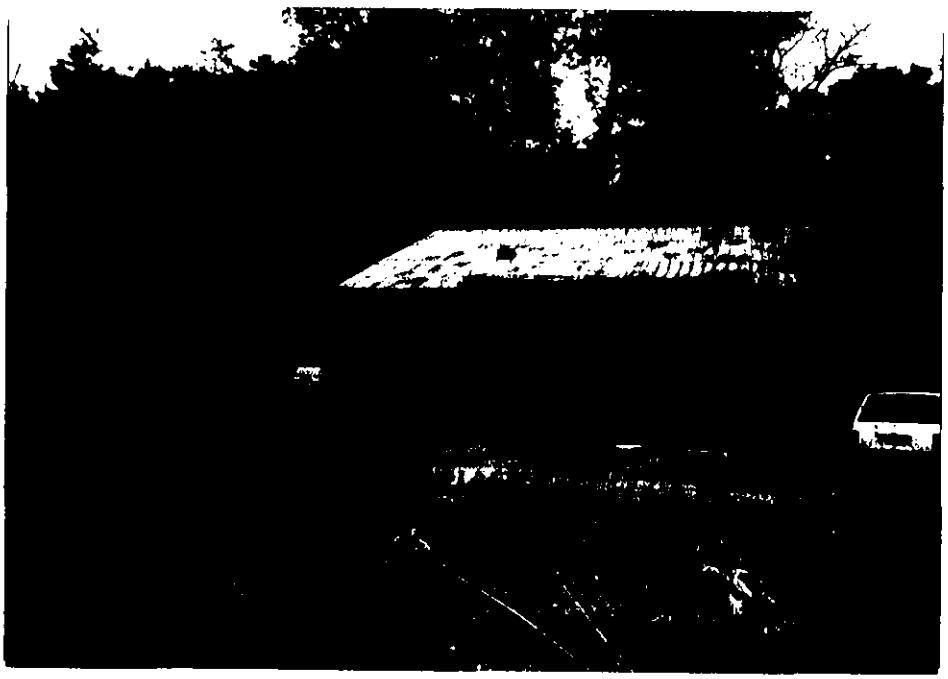


Photograph No. 3
Orientation: East Date: 5/23/93
Description: East doors of warehouse; pit is located beneath pallets shown in front of doors

Photograph No. 4
Orientation: East Date: 5/23/93
Description: East and south walls; area shown is location at which chemical analysis of waste was performed

Photograph No. 5
Orientation: East
Description: View of warehouse from dirt entrance road

Date: 5/23/93



Photograph No. 6
Orientation: North
Description: View of warehouse

Date: 5/23/93

Photograph No. 7
Orientation: West
Description: View of site entrance

Date: 5/23/93

Photograph No. 8
Orientation: East
Description: View of bike path facing old wastewater treatment plant

Date: 5/23/93